

Culturally Tailored ICT4D

Designing *with* Communities, Culture
and Context

Susan Hansen

A thesis submitted for the degree of Doctor of Philosophy in Computing Sciences
April 2019

Interaction Design and Human Practice Laboratory
School of Software
Faculty of Engineering and Information Technology
University of Technology Sydney

Certificate of Original Authorship

I, Susan Hansen declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy in Computing Sciences, in the School of Software, Faculty of Engineering and Information Technology at the University of Technology Sydney.

The thesis is wholly my own work unless otherwise reference or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

This research is supported by the Australian Government Research Training Program.

Production Note:

Signature: Signature removed prior to publication.

Date: 18 April 2019

Acknowledgement

Every aspect of my PhD has involved and been enabled by the support, participation and help of others. As a result there are many people to thank after this long journey! However, there are two people in particular who played a critical role in making my research possible – my principal supervisor, Professor Toni Robertson, and one of my co-supervisors, Professor Alfredo Terzoli.

Toni – you have been an amazing supervisor and I feel incredibly lucky to have been supervised and mentored by you. Thank you for providing me with an academic home, for supporting my unusual research and persevering bumpy roads and no electricity to visit me in rural South Africa!

Alfredo – thank you for welcoming me so enthusiastically into the Siyakhula Living Lab! I am very grateful for the support you provided during my time in South Africa and beyond, that you saw value in the changes of my research direction over time and gave me the freedom within the project to create Interplay.

I would not have found myself in South Africa if it were not for Professor Nic Bidwell. Nic – thank you for inviting me to part of your digital storytelling workshop many years ago and introducing me to South Africa. You have been a role model, mentor and friend throughout my research journey and I am eternally grateful for each of these things.

Next I want to thank Dr Laurie Wilson. My love of research and idea for pursuing a PhD occurred to me while working at CSIRO. For the majority of my time at CSIRO I had the privilege of working with and reporting to Laurie. Laurie – thank you for your mentorship, supervision and continued support throughout both my research career at CSIRO and my PhD journey.

Associate Professor Tuck Leong – Thank you for your support, especially in the final stages of writing and for helping me cross the finish line!

Reaching the finish line of my PhD journey has been assisted by the patience and understanding of many of my friends and loved ones. There are three people who have been particularly hands-on with their help. Mat Lipson – thank you for your wonderful illustration skills! for your food deliveries and active support throughout the writing up of the thesis. Dr Duncan Stevenson and Swa Rath – thank you for being crazy enough to volunteer to proof read my thesis and for your ongoing friendships.

Moving on from Australia to South Africa I want to start by thanking my isiXhosa teacher, co-writer of *Interplay*, interpreter and friend Linda Nelani - enkosi kakhulu sisi! To the late Professor Gary Marsden and his beautiful wife Gil Marsden – thank you for providing a base for me in Cape Town, for your generosity and friendship. I am devastated by the loss of Gary but feel incredibly lucky to have known him and been on the receiving end of his generous support.

At Rhodes University a special acknowledgement to Professor Lorenzo Dalvit and Professor Russell Kaschula for introducing me to the Siyakhula Living Lab. There were many people at Rhodes who were a significant part of my time in Grahamstown. In particular I want to thank Dr Hannah Thinyane, Dr Mathe (Maema) Ntsekhe, Dr Mosiuoa Tsietsi, Sibukele Gumbo, Associate Professor Caroline Pade and Mitchell Kavhai.

I was fortunate to work with the very talented Thozì Ngeju. Thank you Thozì for bringing life to *Interplay* and bringing a level of experience that surpassed what I had hoped when creating this educational play. *Interplay* was also supported by the Drama Department at Rhodes University, in particular by Jacques De Kock and Professor Andrew Buckland. In addition, thank you to all of the talented actors of the original production Sindi Dingana, Mzawanele Jodwana, Philabadane Lunika Majiza, Lindisipho Swartbooi, Thandiswa Tsili and Xolela Tsili and recent additions to the cast Khaya Kondile and Sinethemba (Mimi) Mthwa. Big thanks to my friends involved in filming *Interplay* – Sarah de Possesse, Richard Stupart, Lisa Mazzotta, Keith Diamond and Chad Trytten.

To the extremely talented Egazini Outreach Project artists – it has been a privilege and pleasure getting to know you and be part of your lives. To the artists no longer with us, the late Vukile Teyise, Nomathemba Tana, Papama Lubelwana and Linga Diko, you are very much missed. To Violet Booï, Daniwe Gonqa, Uyanda Tom and Feziwe Diko, I look forward to your continued friendship.

Moving back to Australia now, my journey as a researcher began with two influential people at the University of New South Wales, Emeritus Professor Ralph Hall and the late Carol Healy. I owe my exposure to a solid grounding in quantitative and qualitative research methods, as well as support during my undergraduate research that paved the way for my research career to both of you.

At UTS it was Associate Professor Ken Dovey who first suggested I contact the African Languages Department at Rhodes University in South Africa to learn isiXhosa. Ken – thank you, not only for the suggestion that influenced the rest of my research but for your continued encouragement throughout my time in South Africa. To my fellow lab members in the Interaction Design and Human Practice Lab both past and present, other UTS PhD candidates, previous colleagues and Ultimo locals, thanks for being such great peers and providing a strong support network! A special thanks to Dr Penny Hagen, Dr Julia Prior, Dr Jane Li, Dr Jessica Frawley, Jeannette Durick, Sylvan Rudduck, Vincent Tsang, Michelle Pickrell, Anja Wessels and Kate Graham.

I would also like to acknowledge the continued encouragement and guidance of the following UTS current and ex-staff members – Teraesa Ashworth, Craig Shuard, Dr Laurel Dyson, Associate Professor Raymond Lister and last but not least, David Taplin.

...and finally, a heartfelt thanks goes to my family – my parents Sunja and Geoff Hall and Erik Hansen, my Aunt Diane Joh who enabled the regular flights between South Africa and Australia, and my beautiful twin sisters Sarah de Possesse and Jackie Newcomb. I am actually submitting my thesis now!

This research is supported by an Australian Government Research Training Program Scholarship and the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

Table of Contents

INTRODUCTION.....	1
1.1 BACKGROUND	3
1.2 RESEARCH CONTEXT	4
1.3 RESEARCH OVERVIEW	7
1.4 KEY CONTRIBUTIONS	11
1.5 CHAPTER OVERVIEW.....	12
INFORMATION AND COMMUNICATION TECHNOLOGY FOR DEVELOPMENT (ICT4D).....	14
2.1 ICT4D HISTORY AND TRENDS	15
2.2 HUMAN-COMPUTER INTERACTION (HCI) AND HUMAN-COMPUTER INTERACTION FOR DEVELOPMENT (HCI4D)	19
2.3 THREE PRIMARY APPROACHES TO ICT4D.....	23
2.4 TECHNOLOGY FOCUSED ICT4D.....	24
2.5 GENERIC DESIGN RESEARCH APPROACHES	29
2.6 CULTURALLY TAILORED APPROACHES	35
2.7 SUMMARY OF THREE APPROACHES.....	44
METHODOLOGY AND RESEARCH JOURNEY	47
PART ONE: METHODOLOGY	48
3.1 PARTICIPATORY APPROACHES	48
3.2 PARTICIPATORY ACTION RESEARCH	54
3.3 PHILOSOPHICAL AND THEORETICAL FOUNDATIONS OF PAR.....	55
3.4 AFFECTING POSITIVE CHANGE	56
3.5 LIMITATIONS OF PAR	59
PART TWO: RESEARCH JOURNEY.....	61
3.6 SCOPING PHASE: IDENTIFYING AN ICT4D CASE STUDY.....	61
3.7 CYCLE A: INVESTIGATING OPPORTUNITIES IN THE SIYAKHULA LIVING LAB TO DESIGN A MOBILE HEALTH APPLICATION	67
3.8 CYCLE B: DESIGNING AN E-COMMERCE MOBILE APPLICATION WITH THE EGAZINI OUTREACH PROJECT.....	77
3.9 CYCLE C: PRODUCING AN EDUCATIONAL PLAY ABOUT THE INTERNET	84
STAKEHOLDER INTERVIEWS	89
4.1 AIM	92
4.2 STAKEHOLDER INTERVIEW STUDY DESIGN	92
4.4 DISCUSSION OF FINDINGS	120
4.5 DISCUSSION OF THE BENEFITS OF STAKEHOLDER INTERVIEWS.....	125
4.6 FUTURE WORK BASED ON STAKEHOLDER INTERVIEWS.....	132
4.7 SUMMARY OF RESEARCH CYCLE A	132

EGAZINI OUTREACH PROJECT.....	135
5.1 THE EGAZINI OUTREACH PROJECT – BACKGROUND AND CURRENT STATE	138
5.2 RESEARCH ENGAGEMENT WITH EGAZINI ARTISTS	140
5.3 BACKGROUND STORIES OF THE EGAZINI ARTISTS	155
5.4 REFLECTIONS AND LEARNINGS.....	170
5.5 SUMMARY OF RESEARCH CYCLE B	172
INTERPLAY: THE INTERNET EDUCATION PLAY	175
6.1 MOTIVATION BEHIND INTERPLAY	177
6.2 CREATING INTERPLAY: TRANSFORMING THE IDEA INTO REALITY	180
6.3 EVALUATING AND REFINING INTERPLAY	187
6.4 INTERPLAY PERFORMANCES.....	190
6.5 REFLECTING ON THE INTERPLAY EXPERIENCE	197
6.6 SUMMARY OF RESEARCH CYCLE C	200
REFLECTION ON METHODOLOGY AND METHODS USED.....	203
7.1 REFLECTION ON PARTICIPATORY ACTION RESEARCH APPROACH IN ICT4D	204
7.2 REFLECTION ON METHODS AND TOOLS USED IN THIS RESEARCH	211
CONTRIBUTIONS AND CONCLUSION	221
8.1 REVISITING THE AIMS AND RESEARCH QUESTIONS.....	223
8.2 CONTRIBUTIONS.....	231
8.3 RESEARCH JOURNEY WRAP UP AND POST-SCRIPT.....	233
8.4 FUTURE WORK.....	235
8.5 IN CLOSING	237
REFERENCES.....	239
APPENDIX	249
1. STAKEHOLDER INTERVIEW GUIDE	249
GLOSSARY	250

List of Figures

FIGURE 1 KEY SOUTH AFRICAN RESEARCH LOCATIONS	5
FIGURE 2 RESEARCH JOURNEY TIMELINE	8
FIGURE 3 PARTICIPATORY ACTION RESEARCH CYCLE USED IN THIS RESEARCH	57
FIGURE 4 RESEARCH JOURNEY TIMELINE (WITH SECTION REFERENCES)	61
FIGURE 5 SCOPING PHASE LOCATIONS AND KEY GROUPS	63
FIGURE 6 CYCLE A RESEARCH LOCATIONS AND ACTIVITIES	69
FIGURE 7 CYCLE B RESEARCH LOCATIONS AND ACTIVITIES	80
FIGURE 8 CYCLE C RESEARCH ACTIVITIES	86
FIGURE 9 KEY STAKEHOLDER LOCATIONS IN SOUTH AFRICA	95
FIGURE 10 SIYAKHULA LIVING LAB STAKEHOLDER ECOSYSTEM 2010-2011	99

List of Tables

TABLE 1 THE MILLENNIUM DEVELOPMENT GOALS	16
TABLE 2 SUMMARY OF ICT4D PHASES	18
TABLE 3 SUMMARY OF ICT4D APPROACHES	45
TABLE 4 USEFUL QUESTIONS FOR ICT4D PROJECTS WITH COMMUNITIES.....	54
TABLE 5 RESEARCH AIMS AND QUESTIONS FOR CYCLE A	68
TABLE 6 RESEARCH AIMS AND QUESTIONS FOR CYCLE B	78
TABLE 7 RESEARCH AIMS AND QUESTIONS FOR CYCLE C	85
TABLE 8 RECAP OF RESEARCH AIMS AND QUESTIONS FOR CYCLE A	91
TABLE 9 ORGANISATIONS AND ROLES OF PARTICIPANTS INTERVIEWED	96
TABLE 10 STAKEHOLDER AGENDAS ACCORDING TO AREA OF FOCUS	100
TABLE 11 STAKEHOLDER VISIONS FOR THE SIYAKHULA LIVING LAB	104
TABLE 12 PERCEIVED BENEFITS OF THE SIYAKHULA LIVING LAB	106
TABLE 13 RESERVATIONS ABOUT THE SIYAKHULA LIVING LAB	110
TABLE 14 SUCCESS CRITERIA	114
TABLE 15 EVIDENCE OF CURRENT SUCCESS	118
TABLE 16 STAKEHOLDER INTERVIEW VALUES	126
TABLE 17 RECAP OF RESEARCH AIMS AND QUESTIONS FOR CYCLE B.....	137
TABLE 18 RECAP OF RESEARCH AIMS AND QUESTIONS FOR CYCLE C.....	177
TABLE 19 KEY INTERPLAY RELATED ACTIVITIES	181
TABLE 20 COMPONENTS NEEDED TO PRODUCE INTERPLAY	182
TABLE 21 KEY SUGGESTIONS FOR INTERPLAY FROM PILOT #1.....	189

List of Images

IMAGE 1: SPEECHES AT THE LAUNCH OF THE DIGITAL ACCESS NODE IN FEBRUARY 2010.....	70
IMAGE 2: DWESA COMMUNITY MEMBERS AT LAUNCH OF THE DIGITAL ACCESS NODE	70
IMAGE 3: ENTERING THE WILD COAST ON THE WAY TO THE MBASHE REGION	74
IMAGE 4: MBASHE REGION OF THE FORMER TRANSKEI	74
IMAGE 5: EGAZINI ARTISTS STANDING IN FRONT OF THE EGAZINI OUTREACH PROJECT IN 2011	135
IMAGE 6: EGAZINI ARTIST IN CONVERTED POLICE STABILITY UNIT	139
IMAGE 7: INITIAL SCOPING VISIT TO EGAZINI OUTREACH PROJECT.	141
IMAGE 8: EGAZINI ARTISTS SHARE PERSONAL PHOTOS DURING AN INTRODUCTORY WORKSHOP	143
IMAGE 9: EGAZINI ARTISTS AND SIYAKHULA LIVING LAB MEMBERS MEET	144
IMAGE 10: EGAZINI ARTISTS HOLDING THE TEA TOWELS THEY MADE FOR AMAKHALA GAME RESERVE.....	146
IMAGE 11: EGAZINI ARTISTS AND LINDA AT AMAKHALA GAME RESERVE FOR A SAFARI.....	146
IMAGE 12: EGAZINI ARTISTS WAITING FOR CUSTOMERS TO BUY THEIR ARTWORK IN A PORT ALFRED MARKET.....	148
IMAGE 13: MY SON AND MY HOUSE (VUKILE TEYISE)	150
IMAGE 14: IN FRONT OF MY NEW HOUSE (VIOLET BOOI)	150
IMAGE 15: MY CHAIR (VIOLET BOOI)	150
IMAGE 16: MY GOATS (MAMJWARHA DANIWE GONQA)	151
IMAGE 17: (MAMJWARHA DANIWE GONQA)	151
IMAGE 18: CIRCUMCISION CEREMONY 1 OF 2 (NOMATHEMBA TANA)	151
IMAGE 19: CIRCUMCISION CEREMONY 2 OF 2 (NOMATHEMBA TANA)	152
IMAGE 20: (PAPAMA LUBELWANA)	152
IMAGE 21: GETTING A HAIRCUT (PAPAMA LUBELWANA)	152
IMAGE 22: MY SON NEXT TO MY HOUSE (FEZIWE DIKO)	153
IMAGE 23: (FEZIWE DIKO)	153
IMAGE 24: SOME COMMUNITY MEMBERS GATHER TOGETHER TO EAT AFTER THE BURIAL OF PUX.	154
IMAGE 25: VUKILE TEYISE, “Vux”, 1959 - 2017	156
IMAGE 26: AFRICAN WOMAN, PRINT 1 OF 30	157
IMAGE 27: VIOLET BOOI, “MAMA BOOI”, B.1940	158
IMAGE 28: BAG MADE FROM HAND PAINTED MATERIAL USING BREAD FLOUR	159
IMAGE 29: MAMJWARHA DANIWE GONQA, “MAMA GONQA”, B. 1932.....	160
IMAGE 30: ELEPHANT LINOCUT CARD.....	161
IMAGE 31: NOMATHEMBA TANA, “MAMA TANA”, 1953 – 2015	162
IMAGE 32: AMANZI AMTHATHA, PRINT 8 OF 15.....	164
IMAGE 33: PAPAMA LUBHELWANA, “Pux”, 1967 – 2012.....	165
IMAGE 34: A BOY WITH HIS CHILD, PRINT 3 OF 10.....	167
IMAGE 35: FEZIWE MTHWARHA DIKO, “FEZIWE”, B. 1960	168

IMAGE 36: FEZIWE'S LATE HUSBAND, LINGA DIKO, 1963 – 2011	169
IMAGE 37: AMANZI AWEKHO BY LINGA DIKO, PRINT 12 OF 15	169
IMAGE 38: INTERPLAY PROMOTIONAL POSTER.....	175
IMAGE 39: INTERPLAY DINNER SCENE.....	186
IMAGE 40: INTERPLAY REHEARSAL OUTSIDE AN ACTOR'S HOUSE IN THE JOZA TOWNSHIP	187
IMAGE 41: ORIGINAL INTERPLAY CAST	191
IMAGE 42: EGAZINI ARTISTS AND OTHER AUDIENCE MEMBERS AT THE PREMIERE PERFORMANCE OF INTERPLAY	192
IMAGE 43: OPENING SCENE OF INTERPLAY. SUBTITLES CAN BE SEEN PROJECTED IN THE BACKGROUND.	194
IMAGE 44: LINDA, THE ACTORS AND I AFTER THE THIRD PERFORMANCE OF INTERPLAY	196
IMAGE 45: INTERPLAY BEING PERFORMED AT A LOCAL SCHOOL	197
IMAGE 46: SCHOOL CHILDREN WATCH AN INTERPLAY PERFORMANCE	197
IMAGE 47: LINDA, THE ACTORS AND I AFTER THE FINAL PERFORMANCE OF INTERPLAY AT THE 2015 NATIONAL ARTS FRINGE FESTIVAL	238

Abstract

This thesis describes my research journey as it evolved from designing a mobile health application, to the production of *Interplay*, an educational play about the internet. The research was part of an Information and Communication Technology for Development (ICT4D) project based in the Eastern Cape Province of South Africa. A key aim of my research was to make a positive contribution to the *Siyakhula Living Lab*, a large collaborative ICT4D venture between Rhodes University, the University of Fort Hare, industry partners, government and community members.

Participatory action research and participatory design provided the methodological foundations for the three cycles of research that took place over three years between 2009 and 2012. The research involved a series of stakeholder interviews, fieldwork, introductory workshops and the design and development of an educational play. Methods used and findings throughout the research journey are detailed, from the first cycle trying to understand the local and project context with the hope of making a positive contribution, through to the final cycle involving the premiere performances of the educational play, *Interplay*.

This thesis advocates the greater use of culturally tailored methods in ICT4D. Research findings support using participatory methodologies and culturally tailored methods to increase the chances of making a positive impact in ICT4D projects and to reduce the risk of harm to participants and their communities. The major contributions of this thesis are methodological. In particular it:

1. Demonstrates the value of conducting stakeholder interviews in an ICT4D project,
2. Demonstrates the role of social relationships in enabling active participation in an ICT4D project,
3. Demonstrates how cultural factors influenced the choice and use of methods in an ICT4D project, and

4. Provides a case study of the creation of a culturally tailored method to support mutual learning in ICT4D.

Finally, Interplay itself exists as a tangible outcome and contribution of this research. It continues to be used to enable learning about the opportunities offered by the internet within communities in the Eastern Cape Province of South Africa.